1. U.S. Agriculture—Linking Consumers and Producers

What Do Americans Eat?

Consistent with dietary and health recommendations, Americans now consume a half more grain products and a fourth more fruits and vegetables per capita than they did in 1970, eat leaner meat, and drink lower fat milk. Moreover, a steady increase in the proportion of refined flour that is enriched (from 65 percent in 1970 to more than 90 percent today) and changes in flour-enrichment standards in 1974 and 1983, along with big increases in grain product consumption since 1984, have boosted per capita supplies of four of the nutrients lost in the milling process and approximately replaced by manufacturers—iron, niacin, thiamine, and riboflavin, and, since January 1, 1998, folate.

But contrary to recommendations, Americans are consuming record-high amounts of caloric sweeteners and some high-fat dairy products, and near-record amounts of added fats, including salad and cooking oils and baking and frying fats. Moreover, the hefty increase in grain consumption reflects higher consumption of mostly refined, rather than high-fiber, whole-grain products—less than 2 percent of the 150 pounds of wheat flour consumed per capita in 1997 was whole wheat flour. (Most nutrients lost during processing, including fiber, vitamins, minerals, and phytochemicals, are not restored to refined flour.)

A variety of factors are responsible for the changes in U.S. consumption patterns in the last 25 years, including changes in relative prices, increases in real (adjusted for inflation) disposable income, and more food assistance for the poor. New products, particularly more convenient ones, also contribute to shifts in consumption, along with more imports, growth in the away-from-home food market, expanded advertising programs, and changes in food-enrichment standards and fortification policy. Sociodemographic trends also driving changes in food choices include smaller households, more two-earner households, more single-parent households, an aging population, and increased ethnic diversity. An expanded scientific base relating diet and health, new *Dietary Guidelines for Americans* designed to help people make food choices that promote health and prevent disease, improved nutrition labeling, and a burgeoning consumer interest in nutrition also influence marketing and consumption trends.

USDA's Economic Research Service (ERS) estimates per capita food supplies, based on food disappearance data. Estimates of food for domestic human consumption usually are calculated by subtracting measurable uses such as exports, industrial consumption, farm inputs, and end-of-year inventories from total supply (the sum of production, beginning inventories, and imports). Accordingly, the data are indirect

measures of actual consumption. They may overstate what is actually eaten because they represent food supplies available in the market and do not account for waste. Food supply nutrient estimates are derived from the disappearance data by researchers in USDA's Center for Nutrition Policy and Promotion.

Per Capita Meat Supply Larger and Leaner. Now more than ever, we are a Nation of meat eaters—but we are eating leaner meat. In 1999, total meat consumption (red meat, poultry, and fish) amounted to 197 pounds (boneless, trimmed-weight equivalent) per person, 20 pounds above the 1970 level and 91 pounds above the average annual level for the 1930's, when effects of the Great Depression dampened consumption. Each American consumed an average of 18 pounds less red meat (mostly less beef) than in 1970, 35 pounds more poultry, and 3 pounds more fish and shellfish.

Nutritional concern about fat and cholesterol has encouraged the production of leaner animals, the closer trimming of outside fat on retail cuts of meat, the marketing of lower fat ground meat and processed meat products, and consumer substitution of poultry for red meat—significantly lowering the meat, poultry, and fish group's contribution to total fat and saturated fat in the food supply.

Red meat (beef, pork, lamb, and veal) accounted for 58 percent of the total meat supply in 1999, compared with 74 percent in 1970. By 1999, chicken and turkey accounted for 35 percent of the total meat consumed, up from 19 percent in 1970. Fish and shellfish accounted for 7 percent of total meat consumption in both years.

Per capita consumption of beef reached an all-time high of 89 pounds (boneless, trimmed-weight equivalent) in 1976 when beef supplies were at record levels because of liquidation of the Nation's beef herd. It dropped significantly in the late 1970's, remained flat in the early 1980's, and then, from a 1980's high of 75 pounds per capita in 1985, declined steadily to 61.5 pounds in 1993. In 1994-99, increasing supplies of beef and declining beef prices spurred a 2- to 3.5-pound increase in annual per capita consumption of beef.

Consumer concerns about cholesterol and saturated fat, inconsistent quality, and lack of convenience in preparation are behind the negative trend in beef demand. Beginning around 1960, in response to concerns about fat and cholesterol, beef producers began shifting production from the very fat English breeds like Hereford and Angus to the bigger, rangier, less fat, faster growing exotic breeds. This shift led to increasing inconsistency in the quality of beef—a less tender and less juicy product. By 1995, one of four steaks was considered too tough to chew, according to the 1995 National Beef Quality Audit. In addition, the mass entry of women into the paid labor force has drastically reduced consumption of beef roasts and other beef cuts requiring lengthy cooking times.

Beef has lagged behind poultry and pork in marketing value-added, convenience items. In January 1999, the beef industry launched a new advertising campaign that uses the familiar "Beef, It's What's for Dinner" tagline and aims to inform consumers and beef industry channels about a new trend—beef dishes that are fully cooked and ready to microwave and serve in 10 minutes. Such dishes include traditional beef favorites like pot roast, meat loaf, and beef ribs. In addition, in 1998, the beef industry funded new genetic research to improve beef tenderness.

In contrast, per capita consumption of chicken, which remained flat in the early 1970's, steadily increased from 26 pounds (boneless-weight equivalent) in 1975 to 54 pounds in 1999. Similarly, per capita consumption of turkey climbed from 6.5 pounds in 1975 to 14 pounds a year in 1999. The poultry industry has enjoyed great success, partly by catering to consumers. The industry has provided scores of new brand-name, value-added products processed for consumers' convenience, as well as a host of products for foodservice operators. Poultry has also benefited from its lower price relative to beef and health-related concerns about beef.

Year-to-year fluctuations in pork consumption are often quite large, but consumption has been fairly stable in the long run. In fact, annual per capita pork consumption averaged 47.6 pounds per person in 1970-74 and 47.7 pounds per person in 1995-99. The 1990's quantity, however, contained much more lean and much less fat. Through improved breeding and husbandry practices and greater trimming of outside fat on retail cuts, the pork industry has lowered the fat content of retail pork by more than 30 percent since the 1970's.

U.S. per capita seafood consumption for 1999 is estimated at 14.8 pounds, down from a record high of 16.1 pounds in 1987. Despite the 8-percent decline from the 1987 level, average consumption in 1999 was still 26 percent above 1970, even though seafood prices outpaced those of other protein sources during those years. The Consumer Price Indexes (CPI) for fish, red meat, and poultry climbed 481 percent, 223 percent, and 195 percent, respectively, from 1970 to 1998.

The next decade will undoubtedly bring more changes. Technological advances will mean a host of new products in the meat case. With little increase in overall consumption of meat products expected in the next decade, the beef, pork, poultry, and fish industries will try to capture a larger share of a stagnant market by offering more prepared products.

Long-Term Decline in Per Capita Egg Consumption Levels Off in the 1990's. Egg consumption has two components: shell eggs and egg products. Shell eggs are those eggs purchased in cartons in the grocery store. Egg products are eggs that have been processed and sold primarily to food manufacturers and foodservice operators in liquid or dried form. These pasteurized eggs reach consumers as ingredients of foodservice menu items and processed foods—such as pasta, candy, baked goods, and cake mixes—or directly as liquid eggs in grocery stores.

Between 1970 and 1989, total annual consumption of shell eggs and egg products steadily declined about 4 eggs per person per year, from 309 eggs to 237. During the 1990's, total egg consumption has leveled off, fluctuating between 234 and 249 eggs per person per year. The record high for U.S. per capita egg consumption was 421 eggs in 1945.

The decline in per capita egg consumption over the last few decades reflects two very different and somewhat counterbalancing trends: a dominating, nearly constant decline in consumption of shell eggs, and a partially offsetting growth in consumption of egg products during the 1980's and 1990's.

Shell-egg consumption dropped from 276 eggs per capita in 1970 to 178 in 1999. The average annual rate of decline in per capita shell-egg consumption was 4 eggs per year in the 1970's and 5 eggs per year in the 1980's. In the 1990's, the rate of decline in per capita consumption of shell eggs has slowed to less than 1 egg per year and is expected to slow even more.

Much of the decline in shell-egg consumption since 1970 was due to changing lifestyles (for example, less time for breakfast preparation in the morning as large numbers of women joined the paid labor force) and the perceived ill effects of the cholesterol intake associated with egg consumption. Total cholesterol in the U.S. per capita food supply declined 13 percent between 1970 and 1994, from 470 milligrams per person per day to 410 milligrams. Eggs contributed 39 percent of the total cholesterol in the food supply in 1970 and 34 percent in 1994.

Consumption of egg products has doubled since 1983, reaching 71 eggs per person by 1999. The growth period followed more than two decades of relatively constant consumption. Egg product consumption will continue to increase as consumers opt for more prepared foods.

Americans Drinking Less Milk, Eating More Cheese. In 1998, Americans drank an average of 24 percent less milk and ate 2-1/2 times as much cheese (excluding cottage types) as in 1970. Annual per capita consumption of milkfat from fluid milk products (beverage milks and yogurt) has declined by half since 1970 due to lower milk consumption and a trend toward lower fat milks. Americans cut their average consumption of fluid whole milk by two-thirds between 1970 and 1998, and nearly tripled their use of lower fat milks. But because of the growing yen for cheese and fluid cream products, the Nation failed to cut the overall use of milkfat.

Annual per capita consumption of beverage milk declined from 31 gallons in 1970 to less than 24 gallons in 1998. Consumption of soft drinks, fruit drinks and ades, and flavored teas displaced beverage milk in the diet. Big increases in eating away from home, especially at fast-food places, and in consumption of salty snack foods favored soft drink consumption.

The beverage milk trend is toward lower fat milk. While whole milk represented 81 percent of all beverage milk (plain, flavored, and buttermilk) in 1970, its share dropped to 35 percent in 1998. As a result, total beverage milk contributed 51 percent less fat to the average American's diet in 1998 than in 1970. In contrast, rising consumption of fluid cream products meant that they contributed two times as much milkfat to the average diet in 1998 as in 1970. (Per capita consumption of fluid cream products—half-and-half, light cream, heavy cream, eggnog, sour cream, and dips—jumped from 10 half pints in 1970 to 17 half pints in 1998.)

On balance, however, annual per capita consumption of milkfat from all fluid milk and cream products declined by 38 percent in 1970-98, from 9.1 pounds per person to 5.9 pounds. Of that 5.9 pounds, whole milk contributed 2.5 pounds; lower fat milks, 1.7 pounds; and fluid cream products, 1.7 pounds. Skim milk added 0.05 pound of fat to the average diet in 1997, and yogurt (most of which is reduced-fat or fat-free) added 0.09 pound of fat.

Average consumption of cheese (excluding full-skim American and cottage, pot, and baker's cheeses) increased 149 percent between 1970 and 1998, from 11.4 pounds per person to 28.4 pounds. Lifestyles that emphasize convenience foods were probably major forces behind the higher consumption. In fact, two-thirds of our cheese now comes in commercially manufactured and prepared foods (including foodservice) such as pizza, tacos, nachos, salad bars, fast-food sandwiches, bagel spreads, sauces for baked potatoes and other vegetables, and packaged snack foods. Advertising and new products—such as reduced-fat cheeses and resealable bags of shredded cheeses, including cheese blends tailored for use in Italian and Mexican recipes—also boosted consumption.

From 1970 to 1998, consumption of Cheddar cheese, America's favorite cheese, increased 67 percent to 9.7 pounds per capita. Per capita consumption of Mozzarella—the main pizza cheese—in 1998 was 8.7 pounds, 7-1/3 times higher than in 1970, making it America's second favorite cheese. Cream cheese (including Neufchatel) overtook Swiss in the 1980's to become America's third favorite cheese, at 2.3 pounds per person in 1998. Lower fat cheeses accounted for a fifth (reduced fat, 16 percent; nonfat, 4 percent) of supermarket sales for the 52 weeks ending July 11, 1998 (at 20 percent, that is down 2 percentage points from 2 years earlier), according to the International Dairy Foods Association. Lower fat cheeses make up a much smaller proportion of the total cheese used by food manufacturers and foodservice operators.

The Array of Fruit and Vegetable Choices Widens. As Americans increasingly embrace national health authorities' recommendation of consuming at least five fruits and vegetables a day, their array of choices continues to widen. Fresh-cut fruits and vegetables, prepackaged salads, locally grown items, and exotic produce—as well as hundreds of new varieties and processed products—have been introduced or expanded since the early 1980's. Supermarket produce departments carry over 400 produce items today, up from 250 in the late 1980's and 150 in the mid-1970's. Also, the number of ethnic, gourmet, and natural foodstores—which highlight fresh produce—continues to rise.

Consumers increasingly have more access to fresh, local produce as well. The number of farmers' markets reported to State agriculture departments has grown substantially throughout the United States over the last several decades, numbering around 1,755 at the end of 1993 and eclipsing 2,746 in 1998. Some analysts say that the total number of farmers' markets, including those not reported, is more than double that figure.

While the overall market for fruits and vegetables has expanded in the last 15 years, the mix has changed. Shifts have taken place among traditional produce items and between fresh and processed forms. Traditional varieties have lost market share to specialty varieties, and exotic produce has gained favor. For example, per capita consumption of iceberg lettuce fell by 4.4 pounds (or 15 percent) between 1989 and 1997, while per capita consumption of romaine and leaf lettuces increased 2.5 pounds (or 69 percent) during the same period. In addition, many specialty lettuces not yet

tracked in USDA's food supply database—such as radicchio, frisee, arugula, and red oak—gained in popularity in the last several years because of inclusion in fresh-cut salad mixes and in upscale restaurant menus. Annual consumption of fresh carrots jumped up 3-1/2 pounds per person between 1995 and 1997, to 12-1/2 pounds per person, with the introduction of packaged, ready-to-eat baby carrots, which are now a popular lunchbox and snack item.

Consumption of Added Fats and Oils Remains Near Record High. Americans' overriding nutrition concern in the mid-1990's with cutting dietary fat is apparent in the recent per capita food supply data, which show a modest decline since 1993 in the use of added fats and oils. Annual per capita consumption of added fats and oils declined 8 percent between 1993 and 1998, from a record-high 69.7 pounds (fat-content basis) per person to 64.9 pounds. However, average use of added fats and oils in 1998 remained about a fifth above the 1970 level. Added fats and oils include fats and oils used directly by consumers, such as butter on bread, as well as shortenings and oils used in commercially prepared cookies, pastries, and fried foods. Excluded is all fat naturally present in foods, such as in milk and meat.

Studies in the 1950's and 1960's showed that replacing saturated fatty acids and animal fat with polyunsaturated fatty acids lowered blood cholesterol levels. Consequently, diets high in polyunsaturated oils like corn and safflower oils were widely recommended for the prevention of heart disease. Within the added fats and oils group, animal fats declined a fourth from 1970 to 1998 on a per capita basis, and vegetable fats and oils increased roughly two-fifths. Per capita consumption of salad and cooking oils, most of which were high in polyunsaturated fatty acids, nearly doubled between 1970 and 1998, from 15 pounds to 28 pounds.

However, concern developed about the safety of polyunsaturated fatty acids, and interest in the health benefits of monounsaturated fatty acids also increased. Some research suggests that replacing saturated fats with polyunsaturated fats in the diet reduces low-density lipoprotein (LDL)—the harmful form of blood cholesterol—but also reduces protective high-density lipoprotein (HDL)—the so-called "good cholesterol." Meanwhile, replacing saturated fats with monounsaturated fats lowers LDL cholesterol but leaves HDL levels stable. In addition, polyunsaturated fatty acids are more easily oxidized than monounsaturated fatty acids, making them more likely to contribute to atherosclerosis (fatty deposits in the inner layer of the arteries). Monounsaturated fatty acids are the most common fat in foods, but they are particularly plentiful in olive oil, canola oil, almonds, and avocados. In the 1998 food supply, olive oil and canola oil together accounted for 12 percent of total salad and cooking oils, up from 2 percent in 1985. Canola oil also is used in some soft, liquid-oil margarines.

In 1993, health concern about trans-fatty acids (or trans-fats) hit newspaper headlines. Trans-fats are created when liquid oils are hydrogenated to make them more solid and stable at room temperature; they raise LDL cholesterol and lower beneficial HDL cholesterol levels, and are associated with increased risk of coronary heart disease. Hydrogenated fats are used in everything from margarines, shortenings, crackers, cookies, baked goods, and peanut butter to foods fried in fast-food eateries, fried snack foods, and even some soups, beans, and cereals. From 1993 to 1998, per capita consumption of margarine and shortening declined by a third and nearly a

sixth (17 percent), respectively. About 40 percent of the margarine on supermarket shelves today is the old-fashioned stick variety, with the other 60 percent made up of tub or liquid margarines. In 1970, most margarine was the stick variety. In general, the softer the margarine, the lower its percentage of partially hydrogenated oils, and thus the lower the amount of trans-fats.

The U.S. Food and Drug Administration (FDA) proposed in November 1999 that food manufacturers begin disclosing on nutrition labels the amount of trans-fats in prepared food products. Nutrition labels currently list the total grams of fat per serving of product, and that total does include trans-fats, but there is no separate line showing, as they do with saturated fats, the actual amount of trans-fats. By highlighting trans-fatty acids on food labels along with saturated fat, the FDA hopes that it will encourage Americans to vote with their shopping carts and avoid foods that are high in trans-fats and saturated fats. Including trans-fats on food labels is another way for the FDA to encourage food companies to alter ingredients, opting for more healthful alternatives. It could take about 2 years for any new rule to go into effect. Some food manufacturers have already reformulated their products to eliminate trans-fats and are now capitalizing on that fact as a marketing tool.

Grain Consumption Rises by Nearly Half Since 1970. Per capita use of flour and cereal products reached 200 pounds in 1997 from an annual average of 145 pounds in 1980 and 136 pounds in 1970. The expansion in supplies reflects ample grain stocks, strong consumer demand for variety breads and other instore bakery items, as well as grain-based snack foods, and increasing fast-food sales of products made with buns, doughs, and tortillas.

USDA's nationwide food consumption surveys confirm the food supply data, also indicating Americans are eating more grain products. Consumption of grain mixtures—such as lasagna and pizza—increased 115 percent between 1977-78 and 1994. Snack foods—such as crackers, popcorn, pretzels, and corn chips—soared 200 percent, and ready-to-eat cereals were up 60 percent. One of the biggest changes within the grain mixture group was the explosion of ethnic foods, especially Mexican foods. Mexican foods were consumed four times more often in 1994 than in the late 1970's. Yet Americans are still eating a serving or less a day of whole-grain foods, far below the minimum three per day the American Dietetic Association recommends.

Since January 1, 1998, all enriched grain foods—including ready-to-eat breakfast cereals, pasta, bread, rolls, flour, cakes, and cookies—have been fortified with folic acid (the synthetic form of folate, a B-vitamin). In an effort to see what effect this has had, researchers at USDA's Human Nutrition Research Center on Aging at Tufts University in Boston studied a group of mostly white, middle-aged residents of one Massachusetts town and looked at their blood levels of folic acid before and after the food fortification began. They found that average blood levels of folic acid doubled. Just under 2 percent still had folic acid deficiency, compared to 22 percent before the vitamin was added to food. That should reduce the risk of neural tube birth defects like spina bifida. It may also protect adults from heart disease and reduce the chances of cervical cancer in women. Folic acid is found naturally in legumes; liver; many vegetables, especially green leafy ones like spinach; citrus fruits and juices; whole-grain products; and eggs.

Average Consumption of Caloric Sweeteners Hits Record High. Americans have become conspicuous consumers of sugar and sweet-tasting foods and beverages. Per capita consumption of caloric sweeteners (dry-weight basis)—mainly sucrose (table sugar made from cane and beets) and corn sweeteners (notably high-fructose corn syrup, or HFCS)—increased 33 pounds, or 27 percent, between 1982 and 1998. In 1998, each American consumed a record average 154 pounds of caloric sweeteners. That amounted to more than two-fifths of a pound—or 53 teaspoonfuls—of added sugars per person per day in 1997. Of course, some of the 53 teaspoons of added sugars were lost or wasted in the food system or in the home. But even if we allow that as much as 40 percent of the supply of added sugars might be wasted, consumption would remain high—about 32 teaspoonfuls per person a day. USDA's Food Guide Pyramid suggests that people consuming 1,600 calories limit their intake of added sugars to 6 teaspoons per day. The daily suggested limit increases to 12 teaspoons for those consuming 2,200 calories, and to 18 teaspoons for those consuming 2,800 calories.

A striking change in the availability of specific types of sugar occurred in the past three decades. Sucrose's share of total caloric sweetener use dropped from 83 percent in 1970 to 42 percent in 1998, while corn sweeteners increased from 16 percent to 57 percent. All other caloric sweeteners—including honey, maple syrup, and molasses—combined to maintain a 1-percent share.

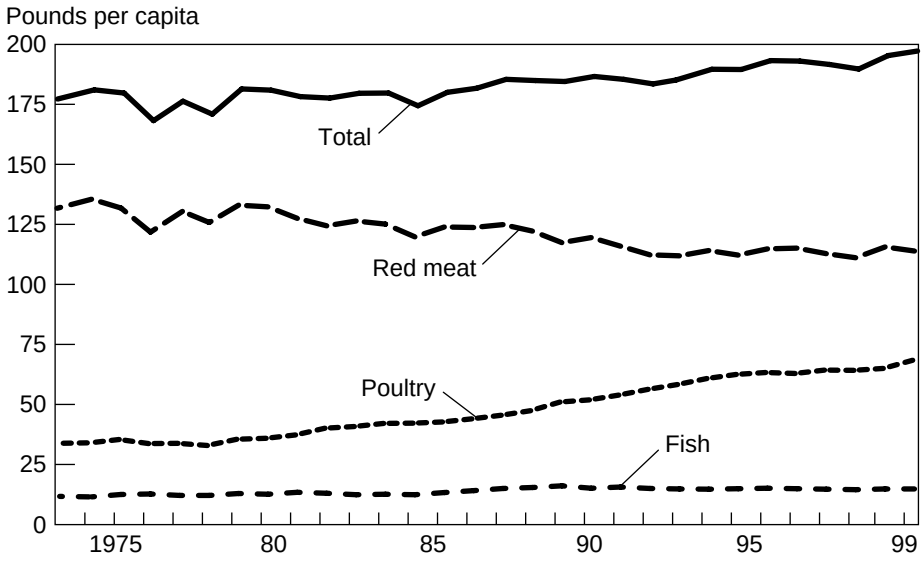
The steep rise in caloric sweetener consumption since the mid-1980's coincides with a 51-percent increase in annual per capita consumption of regular (nondiet) carbonated soft drinks, from 28 gallons per person in 1986 to nearly 43 gallons in 1998 (that is 14.9 ounces per person per day, an amount that contains more than 11 teaspoonfuls of sugar). Carbonated soft drinks provided more than a fifth (22 percent) of the refined and processed sugars in the 1994 American diet.

Sugar—including sucrose, corn sweeteners, honey, and molasses—is, in a sense, the number-one food additive. It turns up in some unlikely places, such as pizza, bread, hot dogs, boxed rice mixes, soup, crackers, spaghetti sauce, lunch meat, canned vegetables, fruit drinks, flavored yogurt, ketchup, salad dressing, mayonnaise, and some peanut butter.

The new food label, introduced in 1994, which lists the amount of sugars in grams (for example, 4 grams equal 1 teaspoon) in a serving of the food, can help people who are trying to moderate their sugar intake. This number includes both added sugars and those naturally present. Foods with natural sugars, such as milk and fruit, are also good sources of other nutrients, such as vitamins and minerals.

Figure 1-1.

Total per capita meat consumption in 1999 was 20 pounds above the 1970 level—a new record high



Boneless, trimmed equivalent.
Source: USDA/Economic Research Service.

Figure 1-2.

Beef is still America's most popular meat but chicken is gaining popularity

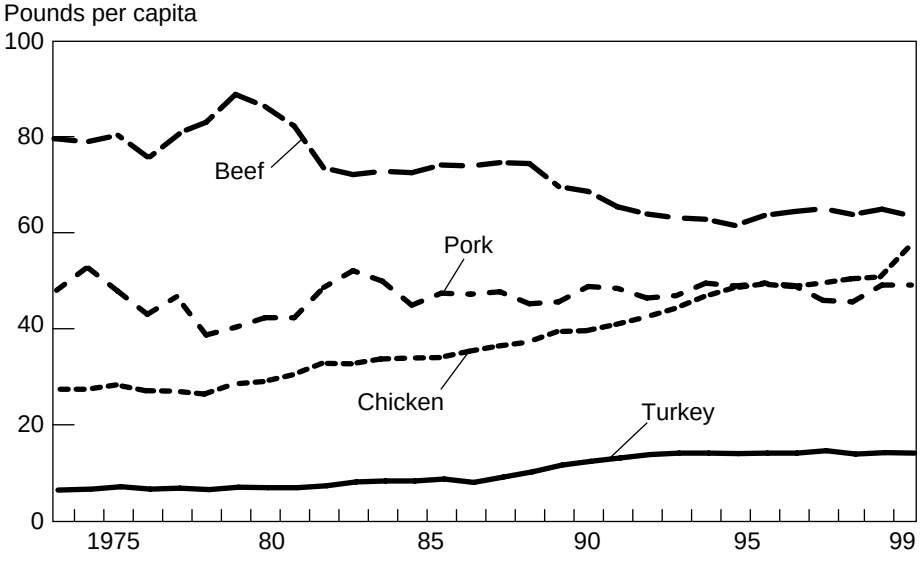
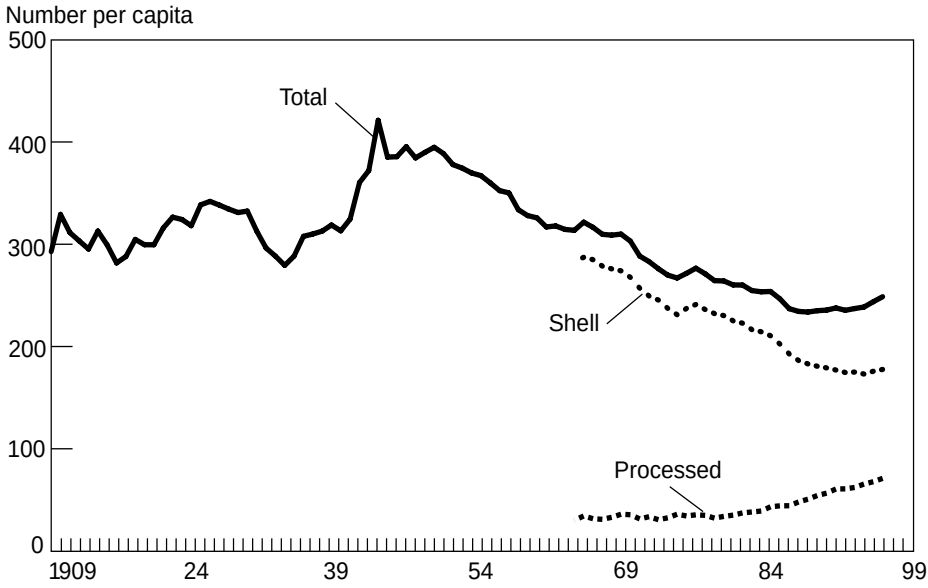


Figure 1-3.

Long-term decline in per capita egg consumption levels off in the 1990's



Source: USDA/Economic Research Service

Figure 1-4.

Per capita consumption of beverage milk declined 24 percent between 1970 and 1998

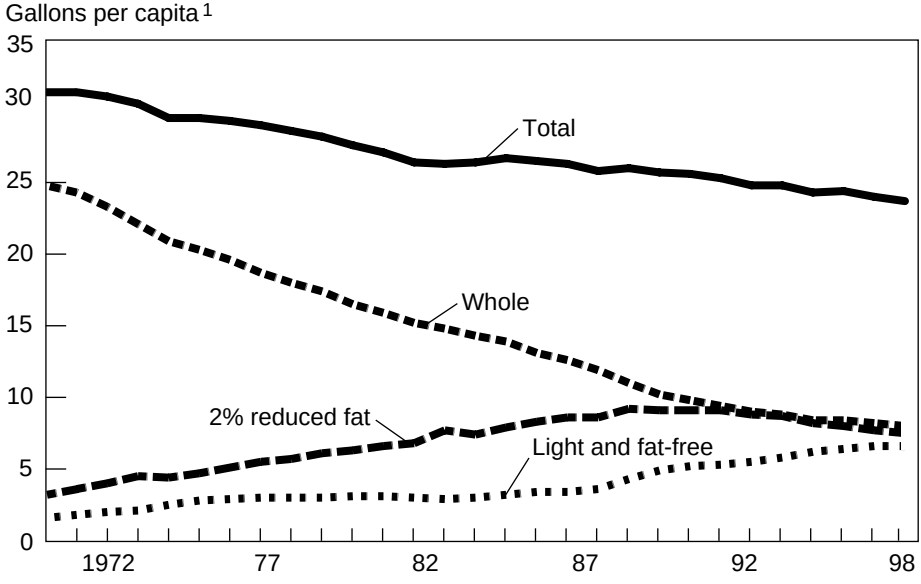
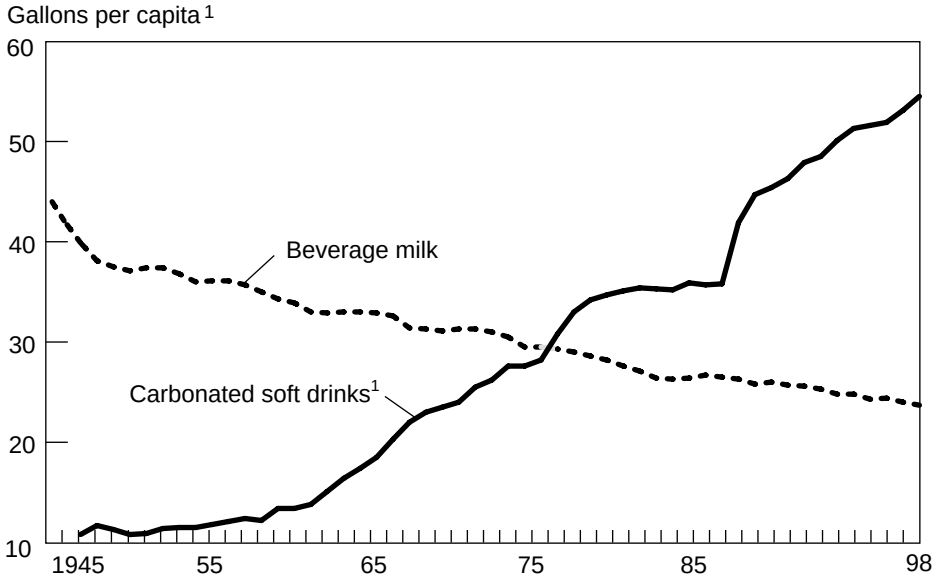


Figure 1-5.

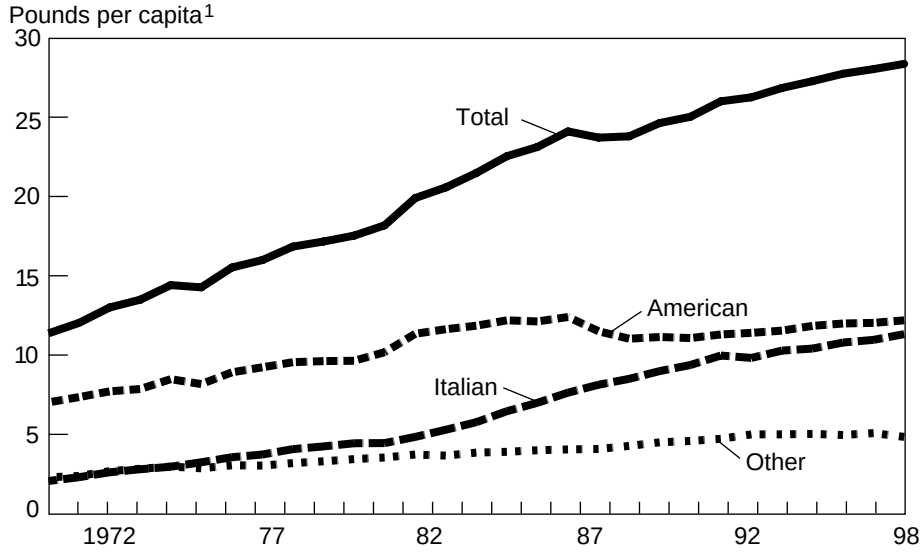
In 1945, Americans drank more than four times as much milk as carbonated soft drinks; in 1998, they downed nearly 2 1/3 times more soda than milk



1Excludes flavored milk and buttermilk.

Figure 1-6.

Per capita consumption of cheese in 1998 was 2 1/2 times higher than in 1970

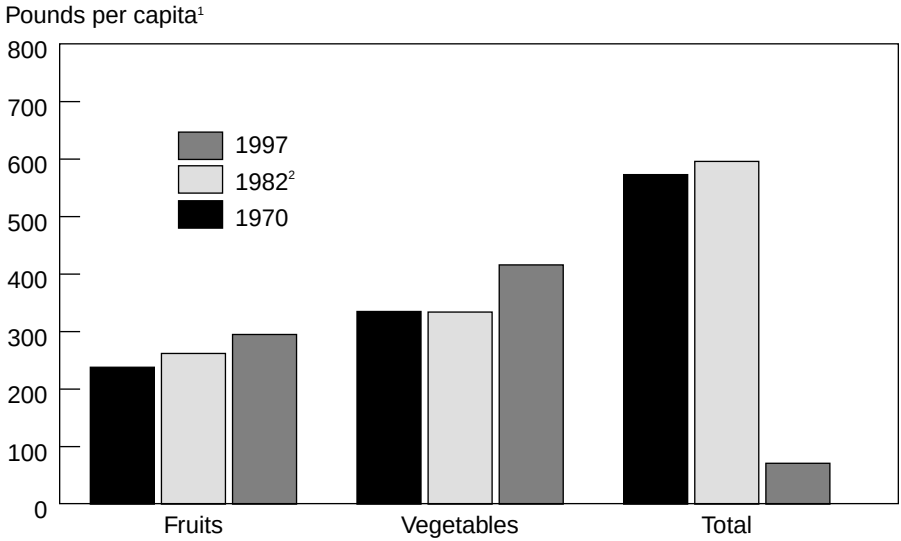


1 Natural equivalent of cheese and cheese products. Excludes full-skim American and cottage type cheeses.

Source: USDA/Economic Research Service.

Figure 1-7.

Total per capita consumption of fruits and vegetables increased 24 percent between 1970 and 1997



[1]Fresh weight equivalent. [2]Publication of *Diet, Nutrition, and Cancer*, which emphasized the importance of fruits and vegetables in the daily diet.

Source: USDA/Economic Research Service.

Figure 1-8.

In 1998, per capita consumption of total added fats was 8 percent below 1993's record-high level but remained a fifth above the 1970 level

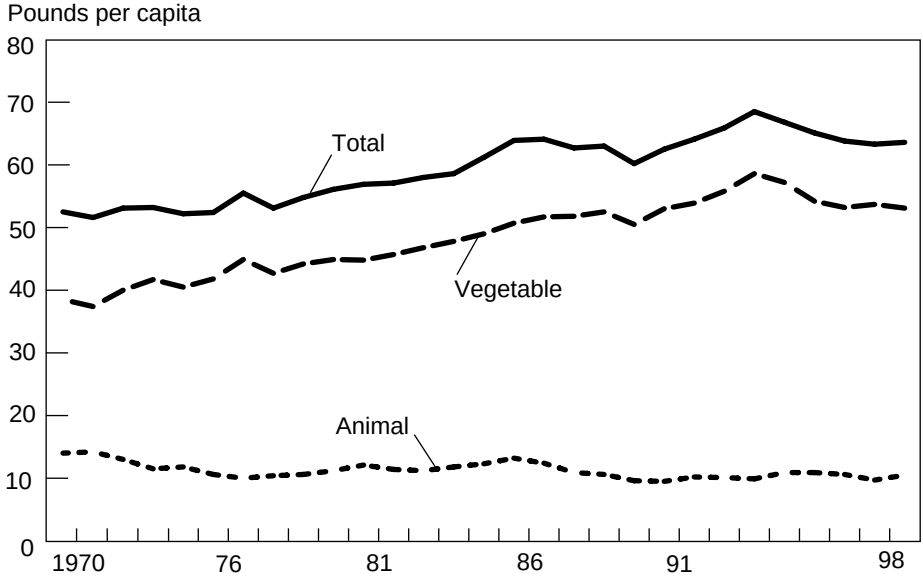
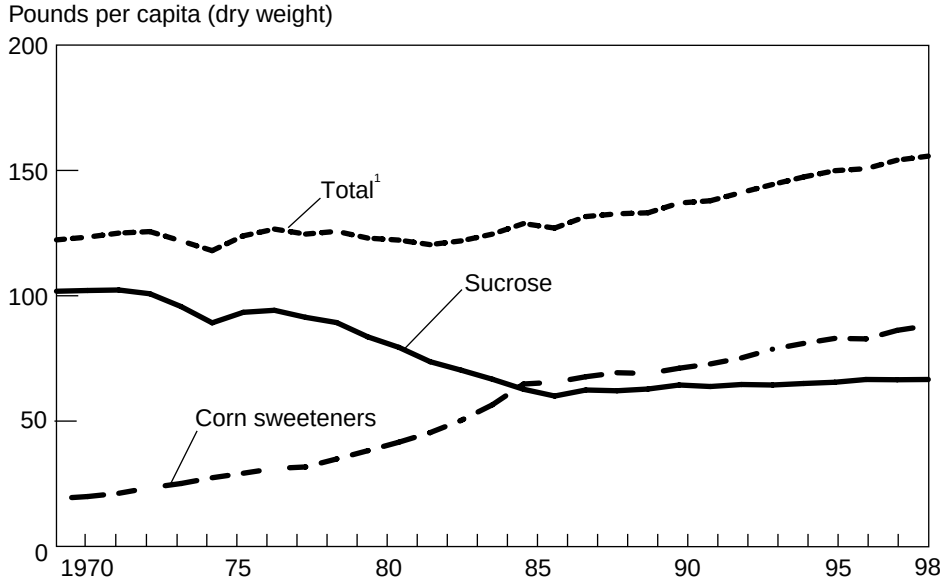


Figure 1-9.

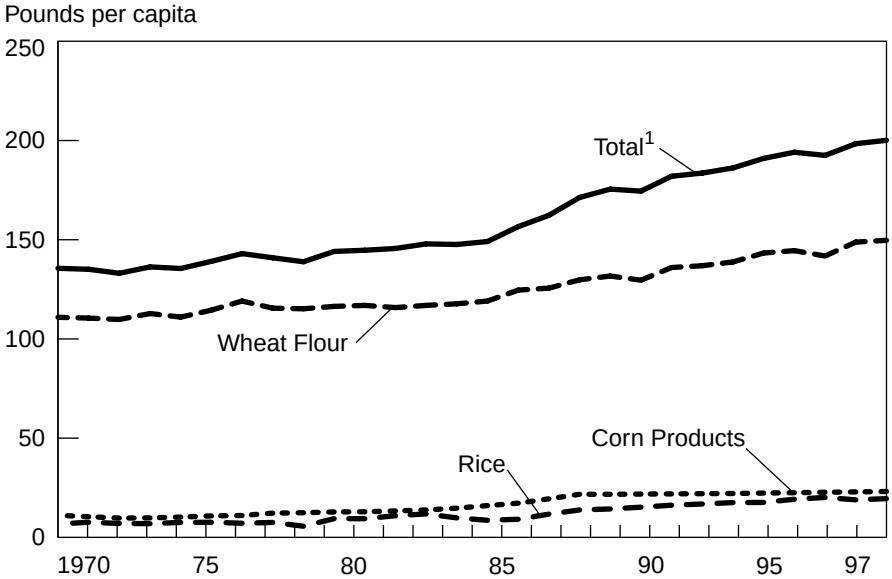
In 1998, Americans consumed an average two-fifths of a pound of sugar a day



[1]Excludes flavored milk and buttermilk.

Figure 1-10.

Consumption of flour and cereal products increased 48 percent between 1970 and 1997 to 200 pounds



[1] Includes oat, rye, and barley products.

Cost of Food Services and Distribution

The estimated bill for marketing domestic farm foods—which does not include imported foods—was $466 billion in 1998. This amount covered all charges for transporting, processing, and distributing foods that originated on U.S. farms. It represented 80 percent of the $585 billion consumers spent for these foods. The remaining 20 percent, or $119 billion, represents the gross return paid to farmers.

The cost of marketing farm foods has increased considerably over the years, mainly because of rising costs of labor, transportation, food packaging materials, and other inputs used in marketing, and also because of the growing volume of food and the increase in services provided with the food.

In 1988, the cost of marketing farm foods amounted to $302 billion. In the decade after that, the cost of marketing rose about 54 percent. In 1998, the marketing bill rose 4.8 percent.

These rising costs have been the principal factor affecting the rise in consumer food expenditures. From 1988 to 1998, consumer expenditures for farm foods rose $186 billion. Roughly 88 percent of this increase resulted from an increase in the marketing bill.

The cost of labor is the biggest part of the total food marketing bill, accounting for nearly half of all marketing costs. Labor used by assemblers, manufacturers, wholesalers, retailers, and public eating places cost $228 billion in 1998. This was 5.1 percent higher than in 1997 and 65 percent more than in 1988. The total number of food marketing workers in 1998 was about 13.8 million, about 17 percent more than a decade ago. About 73 percent of the growth in food industry employment occurred in public eating places.

Wage supplements comprise about 20 percent of total labor costs. However, the cost of wage supplements has accelerated at a slower pace in recent years for two reasons. First, the cost of medical care has risen at a slower pace in recent years. Second, union contracts often require workers to pay a greater portion of their medical care costs.

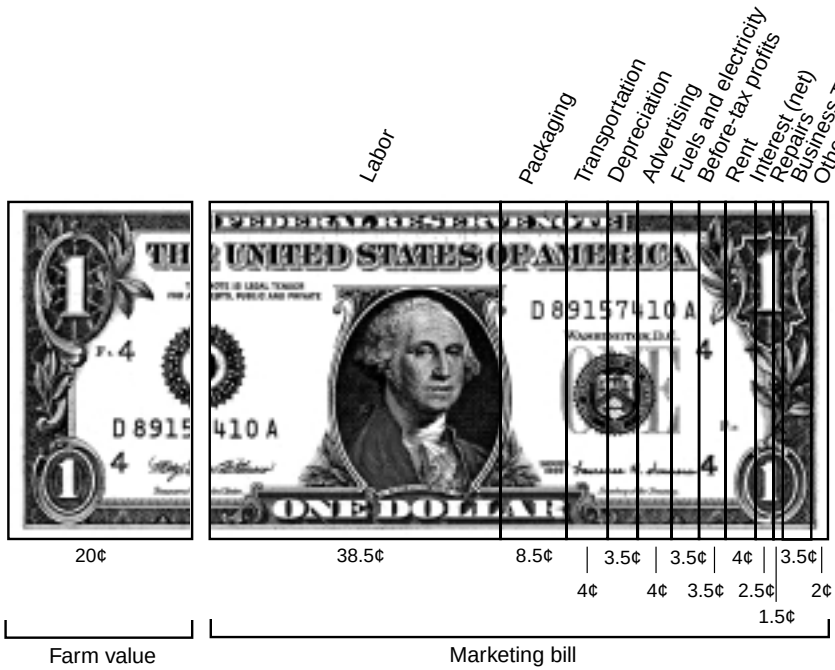
Labor productivity in food manufacturing industries has risen moderately over the years, thereby causing a long-term decline in employment. This trend largely reflects the adoption of various technologies which have reduced industry demand for labor. On the other hand, labor productivity has declined in food stores. This drop reflects increased demand for labor-intensive convenience foods prepared by supermarkets. The additional services which are required to prepare these foods have raised employee hours relative to output, thereby accounting for the lowered productivity.

A wide variety of other costs comprise the balance of the marketing bill. These costs include packaging, transportation, energy, advertising, business taxes, net interest, depreciation, rent, and repairs. Their relative proportions are illustrated in the accompanying dollar chart.

Packaging is the second largest component of the marketing bill. At $50 billion, packaging accounted for 8.5 percent of the food dollar. Paperboard boxes and containers are the largest packaging cost, and comprise approximately 40 percent of total packaging expenses. Metal cans are the second largest packaging expense, making up

Figure 1-11.

What a dollar spent for food paid for in 1998



about 20 percent of total food packaging expenses. The costs of plastic containers and wrapping materials account for another 20 percent of total food packaging expenses. Miscellaneous packaging materials such as glass containers and metal foil account for the remaining 20 percent of total packaging costs.

The energy bill for food marketing costs totaled $21 billion in 1998, and accounted for 3.5 percent of retail food expenditures. Natural gas and electricity prices exert the greatest impact on the energy costs of processing and retailing food. The prices of alternative energy sources, such as oil, have little effect. Public eating places and other food service facilities incur nearly 40 percent of the fuel and electricity costs of food marketing. Their energy expenses have risen because of large growth in the away-from-home food market. Energy costs of food retailers are the second largest, at about 26 percent of the energy bill, and consist mainly of electricity. Electricity is the primary source of energy in these food industries. The food processing sector is responsible for another 20 percent of the food energy bill, and uses a combination of gas and electricity. The wholesaling sector accounts for the remaining 14 percent of the food energy bill, and relies primarily on electricity.

Intercity truck and rail transportation for farm foods came to $24 billion and accounted for about 4 percent of retail food expenditures in 1998. Rail freight rates rose about 3 percent, while trucking rates grew roughly 3.5 percent. Labor costs account for 40 percent of trucking expenses, with fuel comprising another 20 percent.

Advertising expenses totaled $22 billion and comprised 4 percent of food expenditures in 1998. Food manufacturing accounts for about half of total food industry advertising expenditures, with food service contributing another 25 percent, and food retailing about 15 percent. A mix of print and broadcast media are used to promote food industry products. In recent years, food service and food retail firms have experienced the largest increases in advertising expenditures.

Depreciation, rent, and repairs together came to $53 billion and accounted for 9 percent of the 1998 consumer food dollar. The food service sector incurred about 40 percent of these costs, while food stores made up about a quarter of the total. Manufacturing and wholesaling establishments together accounted for the remaining 35 percent. Food service establishments incurred high property rental expenses, and thus had the highest total of any food sector.

Net interest accounts for only 2.5 percent of total consumer expenditures, but grew sharply over the last decade, rising to $13 billion in 1998. Most of the increase occurred in the food store sector, and reflected higher debt acquired due to merger and acquisition activity, particularly leveraged buyouts. Moreover, net interest grew as the result of loans booked during years of rising interest rates, such as 1995.

Food Prices and the Farm-to-Retail Price Spread

In the United States, total retail food prices (including meals served in restaurants) rose 36.0 percent over the last 10 years (1988-98). Prices of food eaten away from home increased 32.3 percent, while retail food store prices increased 38.2 percent.

Prices of goods and services, excluding food, in the Consumer Price Index climbed 38.1 percent over the same 10 years. Transportation was up 30.3 percent; housing, 35.4 percent; medical care, 74.7 percent; and apparel and upkeep, 15.3 percent.

Food prices include payments for both the raw farm product and marketing services. In 1998 the farm value, or payment for the raw product, averaged 2.2 percent of the retail cost of a market basket of U.S. farm foods sold in food stores. The other 7.8 percent, the farm-retail price spread, consisted of all processing, transportation, wholesaling, and retailing charges incurred after farm products leave the farm.

Farm-retail spreads have increased every year for the past 30 years, largely reflecting rising costs of labor, packaging, and other processing and marketing inputs. In 1998, farm-to-retail spreads rose an average of 3.6 percent and farmers received 2.7 percent less for the food they produced. The farm value as a percentage of retail prices was about 1 percent lower in 1998 than in 1997. Meanwhile, retail food prices rose 2.1 percent. Widening farm-retail spreads continued to push up food costs in 1998.

The percentage of the retail price accounted for by the farm value varies widely among foods. Generally, it is larger for animal products than for crop-based foods, and smaller for foods that require considerable processing and packaging. The percentage generally decreases as the degree of processing increases. For example, the farm value of meat was 30 percent in 1998, while cereal and bakery products

had a farm value averaging only 6 percent. The farm inputs needed to feed, house, and maintain the health of livestock are greater than the inputs required to grow crops. The additional manufacturing processes required for cereal and bakery products also result in a lower farm value than for meats. Most other foods also entail fewer inputs at the farm level. Other factors that influence the farm value percentage include transportation costs, product perishability, and retailing costs. Higher levels of these marketing factors tend to lower the farm value percentage.

Table 1-1.

Farm value as a percentage of retail price for domestically produced foods, 1988 and 1998

Items	*1988*	*1998*
Livestock products:		
Meats	45	30
Dairy	40	36
Poultry	49	43
Eggs	53	42
Crop Products:		
Cereal and bakery	9	6
Fresh fruits	25	17
Fresh vegetables	28	20
Processed fruits and vegetables	28	18
Fats and oils	24	22

Figure 1-12.

Distribution of consumer expenditures